

REMARKS

The September 20, 2004 final Office Action has been carefully considered. The Application should be pending, in view of the concurrently filed Petition for Revival. A Request for Continued Examination (RCE) also has been filed, therefore the amendments above should be entered as a matter of right.

The claim amendments above and the following comments are presented in a bona fide effort to address all issues raised in the September 20, 2004 Action and thereby place this case in condition for allowance. Specifically, independent claims 1 and 10 have been amended, to more clearly distinguish those claims over applied art. Independent claim 23 is amended to increase similarity to the amended versions of claims 1 and 10, and thereby facilitate examination in this case together with the previously examined claims. Prompt favorable reconsideration of the amended application is solicited.

The Office Action included a restriction requirement and held that Applicants had elected the subject matter of claims 1-22 by original presentation (and hence prior examination). Hence, claims 23-30 were withdrawn and not otherwise considered in the Action. The restriction requirement is respectfully traversed. Although the statement of the restriction asserts that the subject matter of claims 23-30 is independent and distinct from that of claims 1-22, there is no explanation to support that conclusory statement. For example there is no showing that the two groups of claims relate to combination/sub-combination or to two different combinations disclosed as useable together. In fact, claims 23-30 related to a moveable sensor apparatus as did claims 1-22. Also, there is no showing that the apparatuses claimed are subject to different classifications or require different searches. The restriction mentions recitation of rotation rates in claims 23-30, however, the fact that claims 23-30 specify rotation rates alone is not enough to

justify the restriction requirement. Also, rotation rates are specified in the examined claims, see e.g. claim 7. For at least these reasons, the restriction is incomplete and improper.

Each of the movable sensor apparatuses of claims 1 and 10 includes a housing, one or more supporting extensions, one or more sensors, a linear propulsion mechanism, a triggering unit and a sampling unit. By contrast, the movable sensor apparatus of claim 23 comprises a housing, a propulsion mechanism, a support, a sensor and a drive mechanism. As part of the amendment to overcome art, claims 1 and 10 have been amended to recite that the sensor is for sensing an object buried beneath a surface of the earth (1) or that the sensors are “buried object” sensors (10). By contrast, claim 23 already recited that the sensor was for sensing a characteristic of the ground. Claims 1 and 10 are amended to recite a mechanism to rotate the extension about a first axis and rotate each of the sensor(s) about one or more additional axes. Claim 23 is amended above to specify that the drive mechanism is for driving rotation of the support and for driving rotation of the sensor. Although the subject matter of claim 23 may be independent and distinct from the inventions of claims 1 and 10, absent a showing of separate classification for search purposes, and in view of the noted similarities, it is proper for claims 23-30 to be examined together with the remaining ones of claims 1-22.

For the reasons outlined above, it is requested that the Examiner withdraw the restriction requirement and that reconsideration of this matter include consideration of claims 23-30. Patentability of claims 23-30 was discussed in the previous response.

Claims 1, 3 and 22 were rejected under 35 U.S.C. § 103 as unpatentable over US patent no. 4,636,137 to Lemelson in combination with US patent no. 5,129,308 to Fuereder et al. (hereinafter Fuereder). Claim 1 has been amended to distinguish over the combination of Lemelson and Fuereder. Lemelson discloses a robotic tool. The device includes a camera 34, apparently mounted on the shaft 16 so as to swing about the axis of the jaw assembly 25 (column

6, lines 65-68). The rejection equates the camera 25 to the claimed sensor. Claim 1 now recites that the at least one sensor is for sensing an object buried beneath a surface of the earth and is rotatable so as to scan an area of the surface of the earth. The camera of Lemelson does not meet the sensor requirement of amended claim 1 in that it is not for sensing an object buried beneath the surface of the earth. Fuereder discloses a moveable extension member for a combat vehicle such as a tank. The combat platform 3, 3a on the extension may support video-optics or sensors (column 3, lines 47-52), however, there appears to be no suggestion to use a sensor for sensing an object buried beneath a surface of the earth. Hence, the proposed combination would not meet the sensor requirement of amended independent claim 1. Claims 1, 3 and 22 therefore should be patentable over the proposed combination of Lemelson and Fuereder.

Claims 1-21 were rejected under 35 U.S.C. § 103 as unpatentable over US patent no. 6,333,631 to Das et al. (hereinafter Das) in combination with Lemelson and Fuereder. Das discloses an articulated robotic mine detector, in which one or more mine detectors 3 are mounted at the end of an articulated arm 2. The arm 2 swings from side-to-side to sweep (arc R) the detector 3 over the terrain. Sensors 5 measure position relative to the ground, and a controller adjusts the height of the detector 3 to maintain a constant separation over variable terrain without ever contacting the ground or objects thereon. As noted, claim 1 specifies at least one sensor for sensing an object buried beneath a surface of the earth. Claim 10 recites two "buried object" sensors. The mine detector(s) 3 of Das might be considered to be buried object sensor(s), but the distance sensors 5 would not. In the obviousness rejection, the Examiner recognized that Das does not disclose one (claim 1) or more (claim 10) support extensions that fully rotate about a first axis, and that Das fails to disclose a sensor mounting that allows full rotation of one sensor (claim 1) about a second axis or that allows full rotation of two sensors (claim 10) about respective second and third axes. It is respectfully submitted that the secondary

citations to Lemelson and Fuereder do not make up for these deficiencies of the primary citation to Das.

Claim 1 now recites a mechanism to fully rotate the supporting extension about the first axis and to fully rotate the sensor about its second axis. This rotational movement causes the sensor to scan an area of the surface of the earth as the housing moves. Similarly, claim 10 now recites a mechanism to fully rotate the supporting extensions about the first axis and to fully rotate the first and second sensors about their respective axes. This combination of rotational movement causes the sensors to scan an area of the surface of the earth as the housing moves. Even if Lemelson is viewed as teaching an additional degree of rotational freedom for the sensor(s), and Fuereder is viewed as teaching axis offset, there would still be no positive teaching in the three documents to provide a mechanism to actually fully rotate the extension(s) and the sensor(s) about the various recited axes as the device moves, so that these full rotations together provide the scanning of the recited sensor(s) over the surface area. Hence, the combination would still not include a mechanism to scan one or more sensors in the manner now recited in claim 1 or to scan two sensors in the manner now recited in claim 10.

Also, Lemelson and Fuereder relate to a different art and would not be considered of particular relevance in modifying the mine sweeper device of Das. Lemelson relates to a robotic tool, and Fuereder relates to a robot arm (extension member) for a combat vehicle. Neither provides a teaching as to how either of their subjects would help one to improve a scanning device intended for buried object detection, such as the mine detector of Das. It is therefore submitted that the proposed modification of Das in view of Lemelson and Fuereder would not have been obvious to a person skilled in the art of buried object detection.

For the reasons outlined above, it is believed that the proposed combination of Das, Lemelson and Fuereder does not meet all of the requirements of either independent claim (1 or

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10). Also, it is submitted that the proposed combination would not have been obvious. Claims 1 and 10 and the claims that depend therefrom (2, 6-9, 11, 12, 21 and 22) therefore patentably distinguish over the three applied patents.

For reasons discussed above, all of the pending claims (1, 2, 6-12 and 21-30) should be allowable together in this application. It is therefore submitted that this case should now be in condition for allowance. Prompt favorable reconsideration and issuance of a notice of allowability of all of the pending claims are earnestly solicited.

It is believed that this response addresses all issues raised in the September 20, 2004 Office Action. However, if any further issue should arise that may be addressed in an interview or obviated by an Examiner's amendment, it is requested that the Examiner telephone Applicants' representative at the number shown below.

To the extent necessary, if any, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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